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Island Exports:
Cultural probe creation as a method of design organisation and collaboration

Abstract

In human-centred design processes, co-design encompasses an eclectic mixture of people, objectives, methods and outcomes. Straddling the boundaries between design-led research, sociocultural data collection and the organisational properties of artefacts, this paper explores the cultural probe as the product of collaboration amongst members of a postgraduate design team. Drawing from my experiences of a recent case study, I discuss the cultural probes' purpose as tools to engage with community members in a participatory workshop and as evidence to reinforce the identification of design opportunities on the Scottish island of Islay. However, the probes' role in supporting intra-team co-design during the initial exploratory stages of the design process is the paper's primary concern. The accessibility of hand-drawn sketches, organisational maps and paper prototypes supports an iterative development of the designers' ideas. I propose that the materiality of these artefacts simultaneously embodies each designer's individual lines of enquiry and the collective aspirations of the team. As a result, the paper goes some way to redefining the agency of the designer's own images and artefacts in human-centred design processes. Moreover, it contributes to the transferability of the cultural probe as an epistemic object within design teams and across social research contexts to offer a methodological framework for applying the practitioner-researcher's visual representations as mediators of knowledge.

Keywords: cultural probe, co-design, epistemic objects, visualisation, participatory, Islay

Introduction: Repositioning the probes

In 1999, designers Bill Gaver, Tony Dunne and Elena Pacenti described the sets of activity packages that they created and implemented in a series of community engagement sessions as 'cultural probes' (1999: 22). By encouraging user-participants to record aspects of their daily lives through interacting with postcards, maps, diaries and disposable cameras, the designers collected a wealth of qualitative data that subsequently informed their proposals for site-specific technological devices and systems (1999: 27). Elaborating on his extensive applications of cultural probes with designers Andrew Boucher, Sarah Pennington and Brendan Walker, Gaver has since critiqued the method's adaptation by a multitude of research disciplines. Consequently, the designers express their concerns that the cultural probe has evolved from an exploratory device employed in the design process to apprehend user-participants' subjective experiences (defined as 'probology') to a specific tool deemed capable of gathering precise answers to the researcher's questions (Gaver et al., 2004: 53, 56). In discussing the interpretation of probe responses and their contribution to design solutions, Andrés Lucero, Tatiana Lashina, Elmo Diederiks and Tuuli Mattelmäki point towards some general misgivings surrounding the method and concede that 'The large amount of data resulting from the probes may be perceived as fragmented, too detailed, or even sometimes irrelevant' (2007: 383). Reflecting on the responses collected in their investigation of bathroom lighting systems, however, the design researchers recognise the probe's capacity to evoke users' experiences, emotions and desires, thus suggesting requirements for the human-centred design process (2007: 389).

In advocating a participatory design methodology, Elizabeth B.N Sanders and Pieter Jan Stappers (2008) maintain that the shared ideas and 'collective creativity' of user-participants is sought from the outset and enables the development of solutions that respond to first-hand insights. Tuuli Mattelmäki and Katja Battarbee expand on such notions of participation in relation to the use of design probes. Examining correlations between physical exercise and mental wellbeing, the designers suggest that the visual and material character of 'empathy probes' encourages social relations and an open dialogue in the design process (2002: 268). Furthermore, the probes' experimental nature promotes a broad scoping period to help designers orient themselves amongst the design setting and its associated users (Mattelmäki and Battarbee,

2002: 266). To instigate participation via probes, designers must first exercise their creative and visual sensibilities. The use of the designer's images as prompts in the probe creation process is emphasised by Terry Hemmings, Andy Crabtree, Tom Rodden, Karen Clarke and Mark Rouncefield in their study of probes in Computer Related Design (CRD) environments. In this, the designers consider the practice of reworking and refining probe materials through collaborative activities and underline how cultural probes enlist informal participation from the design team in an inclusive, tangible and accessible way (2002: 44). Building on Mattelmäki and Battarbee's premises, cultural probes can be thought of as artefacts that respond to the particular requirements of the design problem and help tailor co-design activities to meet the abilities of user-participants. When applied as tools in participatory workshops, they cement social relations early in the process and foster an empathic understanding between designers and users (Hemmings et al., 2002: 46). Additionally, Katharina Bredies, Sandra Buchmüller and Gesche Joost acknowledge the roles and responsibilities of the designer at this stage and maintain that their own subjective knowledge is manifest in the probes. As such, the authors concur that probes produced by a group of designers can comprise several components which correspond to the individual research questions of each member (2008: 148–149).

The relationship between cultural probe creation and the designer's underlying hypotheses implies the method's affinity with conventional social scientific data collection tools and techniques. Discussing the human interactions involved in the creation, implementation and evaluation of probes, Connor Graham and Mark Rouncefield assert that the tools vary in the questions they ask, the users they address, the specific types of participation they facilitate and the outcomes they inform (2008: 197). The Royal College of Art's Helen Hamlyn Centre for Design presents a comprehensive inventory of research methods and position probes alongside observation, interviews and questionnaires (2012). Indeed, it can be argued that the perceived limitations of established social scientific methods are partly responsible for the proliferation of participatory data collection tools and techniques in human-centred design. As design researchers Bruce Hanington and Tim Brown agree, when the prescriptive character of interviews and questionnaires fails to uncover users' latent needs, design thinkers must devise 'rule-breaking, game-changing, paradigm-shifting breakthroughs' (Brown, 2009: 40; Hanington, 2003: 13). Recently, Hanington and Martin have reassessed the growing landscape

of human-centred design research and strengthened the agency of cultural probes as an innately subjective and projective method that supports participatory exploration and innovation (2012: 54). In this paper, I interrogate the cultural probe as a research tool firmly anchored in the visual realm and as a designerly alternative to traditional data collection methods. In this sense, I consider cultural probes to encompass the assumptions, experiences and expertise of designers and users. Positioning the cultural probe as a creative, empathic and interpretative bridge amongst and between users' and designers' experiences, I explore how its visual and material presence can enhance collaborative stages in the human-centred design process.

Materially mediated co-design?

The participatory actions, dialogues and outcomes surrounding cultural probes are central tenets of co-design. In 1989, architects Stanley King, Merinda Conley, Bill Latimer and Drew Ferrari employed this term to describe their environmental community consultation workshops. In this, they stress how the designer operates as a visual conductor, interpreting and sketching figurative visions of users' insights and needs (1989: 7–8). In the wake of human-centred design innovation, Sanders and Stappers evaluate co-design in a broader sense as the cooperative relationships formed by designers, users and other related stakeholders that span the breadth of the design process (2008: 6). These distinctions suggest that co-design is transitory, flexible and responsive by nature. As the following passage highlights, King, Conley, Latimer and Ferrari explain how participatory drawing activities can subvert user-participants' experiential knowledge of their local communities and elicit design-led dialogue in an accessible way:

> The point of the drawing exercise is to lessen participants' fear of plans, maps, and other drawings normally found in an architect's office. In addition, the participants then feel less inhibited to comment on each other's drawings and to evaluate the different lifestyles the maps portray. This emphasis on visualisation by drawing is user-friendly and encourages participation.
>
> King, Conley, Latimer and Ferrari, 1989: 163–164

The recontextualisation of drawing practice in the discipline of design pertains to this paper's

contribution. Despite this, the architects' examples of urban regeneration through community participation serve to somewhat suppress the interdisciplinary adaptation of co-design methods and processes. Moreover, their accounts of collaboration tend to concentrate specifically on the designer on one hand and the local residents, council members and policy makers on the other, thus neglecting the designers' shared goals and overlooking the impact of intra-team co-design.

The appropriation of visual and material research tools in collaborative design activities can be thought to combat intangibility, miscommunication and gaps in designers' and users' knowledge. These ideas introduce 'boundary objects' to design practice. In Uri Gal, Youhjin Yoo and Richard J. Boland's 2004 study, the information technology researchers define boundary objects as 'the abstract or physical artefacts which reside in the interfaces between organisations or social communities' (2004: 194). In advancing the artefact's potential to carry and transfer culturally prescribed meanings and to promote consensus amongst collaborators, Gal, Yoo and Boland propose that boundary objects participate in organisational settings to bring about innovation, contribute to the formation of social identities and are, in turn, altered themselves (2004: 197–199). Their conceptions of technological tools as mediators of knowledge can be traced back to Paul Carlile's ethnographic investigation of interorganisational boundary objects within an engineering firm (2002). In this, Carlile monitored the movement of numbers, papers, technologies, drawings, parts, prints, products, machines, schedules and charts across the firm's sales, design, manufacturing and production departments. The outcomes of economic capital, working prototypes, improved manufacturing processes and eventually, a refined product ready for market result from these material and conceptual objects' interactions with human participants at 'pragmatic boundaries' (Carlile, 2002: 449). As a result, Carlile argues that the knowledge characterised by these departments is 'localised, embedded, and invested in practice' and that specialised insights are communicated to and by experts across the firm through verbal discussions and meetings punctuated by boundary objects (2002: 442).

Advancing the applications of the boundary object, design researchers Boris Ewenstein and Jennifer Whyte borrow from sociologist Karin Knorr Cetina's writings on 'epistemic objects' (2001) to interrogate how architectural sketches are capable of unlocking

design knowledge (2009). They use ethnographic methods to observe how a team of architects' drawings are used as tools to simultaneously communicate design requirements and seek feedback in order to propel the design process towards resolution. Here, they evaluate the qualities of boundary, epistemic and 'technical objects' in terms of how they contribute to the acquisition and transferal of knowledge. The epistemic object's ability to ask questions, to be incomplete, unstable and adaptable and to elicit knowledge is key to their investigation. Its evolved counterpart, the technical object, is thought to utilise previous epistemic visual representation to symbolise defined problems and propose solutions, and is therefore classified as concrete and final (Ewenstein and Whyte, 2009: 10). The authors go on to comment on the sensoriality achieved when images and artefacts become involved in tactile design conversations. These interactions are centred literally and conceptually around the architects' intersubjective knowledge and visualisation of the built environment. With their graphic spatial composition probing and provoking the architects to point out functional or aesthetic flaws, the initial sketches operate as epistemic objects,:

> Design here takes the shape of exploration or inquiry. The drawing is an active participant in a process of exploratory, projective reflection. It does not simply depict or *re*present the previous reflections of the designer or designers. Thus the important role visual representations play as knowledge objects is not just on account of their capacity to embed or inscribe knowledge. Inscribing, embedding and containing is only part of the story; the other is lacking, wanting and unfolding in uncharted directions.
>
> Ewenstein and Whyte, 2009: 22

By obscuring the epistemic sketch with tracing paper, the architects use marker pens to correct these flaws and refine their design solutions. The team's insights and expertise are represented and exhibited in this reappropriated drawing. The complete collection of sketches are deemed technical objects — their layers, annotations and reworkings charting the development of the architects' collective and critical decision-making practice (Ewenstein and Whyte, 2009: 22–24).

Responding to these perceptions of design processes, relationships and methods, I consider how the cultural probe at once presents an evocative depiction of the designers' knowledge and objectifies the team's implicit and discursive organisation. Mattelmäki concurs that cultural

probes underpin participatory communication in three ways: the direct discussions which take place between users and designers, the empathic linking of users' experiences to designers' insights, and, significantly, the interpretation of knowledge within the design team (2006: 207). As such, I go on to examine how our team's creation of images and artefacts during the inspiration or pre-design stages offers fertile grounds for establishing co-design relationships and enhancing user participation, data collection and the development of design solutions (Brown, 2009: 64; Sanders and Stappers, 2008: 6).

Instigating collaborative practice in postgraduate design research

In November 2011, our team of masters and doctoral design researchers undertook a project to improve community wellbeing on the island of Islay. Situated in the inner Hebrides of Scotland, Islay was chosen by programme leaders as a location within the remit of The Centre for Design Innovation — a joint initiative conceived by The Highlands and Island Enterprise and The Glasgow School of Art. The centre advocates the use of a human-centred design methodology to identify problematic socioeconomic issues affecting rural businesses and communities, uncover unmet needs, and propose and implement conceptual solutions. In this, their notion of a 'Distributed City' utilises local resources and skills through collaborative ventures to negotiate networks of aspirational communities and ultimately, generate economic growth in this geographic region (The Centre for Design Innovation, 2012).

We were given the task of employing human-centred design research methods to investigate and redesign aspects of Islay as a thriving, enterprising, socially and economically sustainable collection of communities. Through preliminary desk research, our team's initial objective was to integrate the perspective of a curious visitor and the designer's critical mindset. After identifying areas of interest and key user groups, we carried out a focused phase of insight gathering with Islay residents. This data contributed to both the definition of problems and the solutions that we propose in our interventions.

Visualising desk research

Internet articles, tourist-centred Web sites, library catalogue searches, visits to the tourist information centre in Glasgow and anecdotal conversation were paramount in our desk research. A broad approach was embraced. The group considered Islay's historical status, its diverse indigenous and migratory wildlife, geological factors, public transport, ecology and energy awareness, the prevalence of the traditional Gaelic language and socioeconomic factors such as health, employment and education. Examining the island's resources, we also explored the whisky distilling industry, tourism, forms of retail, creative initiatives and the farming and fishing industry. By making textual and visual notes in our sketchbooks, we selected and edited these diverse strands of data.

Fig. 1: Cara Broadley, *Sketchbook Islay map* [drawing – detail], source: Author (2011)

My hand-drawn map (Fig. 1) illustrates many of these aspects whilst evidencing my converging interest in accessing local knowledge through storytelling techniques. I identified a conceptual connection between Ionad Chaluim Chille Ìle (The Columba Centre for Gaelic languages and culture), The Islay Gaelic Choir and a national focus on Gaelic education across Scotland (Ionad Chaluim Chille Ìle, 2010). My initial insights recognise that while these initiatives strive to celebrate the Gaelic language, their primary emphasis is on the teaching and application of linguistic skills rather than connecting distinct user groups through sociocultural engagement. By visualising these discrepancies through drawing, my desk research highlighted a potential design opportunity to reconsider relations between the island's elderly residents and its teenage

community.

Following this brief orientation phase, we regrouped and collated our individual insights. We printed pertinent digital articles and pinned them to our studio wall to create a shared archive of information specific to our needs. From this point, we designated our large drawing of the island map seen in Fig. 2 for the distillation and display of the emergent data we deemed most relevant.

Fig. 2: Fergus Fullarton Pegg, *Collective Islay map 1* [photograph], source: Bell et al. (2011), *Islay Investigation*, Unpublished Masters in Design Innovation research report

As Figs. 3 and 4 highlight, we attached sticky notes to the map to symbolise key landmarks including The Museum of Islay Life in the Port Charlotte area of the island, Loch Gruinart Nature Reserve, Loch Finlaggan (the site of a historical settlement) and its accompanying visitor centre. Acknowledging the cultural and economic value of the distilleries, we hung miniature bottles of whisky on to the map to signify their locations. We noted that thousands of Barnacle geese were expected to arrive in Islay from Greenland at the

time of our project (Islayinfo, 2011). In light of this, we pinned on illustrations of wild animals to indicate where their habitats are situated. Addressing notions of navigation and footfall, we marked the position of Islay's airport and sketched dotted lines to connect the island's two ferry ports to mainland Scotland and the neighbouring Isle of Jura. These images underline how each designer's contribution to the display resulted in a collaborative and tangible visualisation of data collected from several otherwise disparate secondary sources.

Fig. 3: Cara Broadley, *Collective Islay map 2* [photograph – detail], source: Author (2011)

Fig. 4: Cara Broadley, *Collective Islay map 3* [photograph – detail], source: Author (2011)

Reflecting on the map, we noticed that much of our annotations were clustered around the village of Bowmore. Considered to be Islay's 'administrative capital', Bowmore hosts a distillery of the same name, the iconic Round Church, the tourist information centre, The Columba Centre and Islay high school (Islayinfo, 2011). With the aid of our map as an organisational device, we created a series of diagrammatic mind maps in order to identify and investigate a selection of potential user-participants (Fig. 5). Its technologically innovative attitude to learning methods and emphasis on equipping pupils with transferable vocational skills through the Scottish government-led 'Schools of Ambition' programme prompted us to select Islay high school as a context for our user-engagement workshop (Stuart, 2011). Whilst we were keen to carry out two or more comparative sessions with contrasting user groups, time dictated that we concentrate our efforts on the high school pupils to provide a more in-depth insight gathering session. Our early search for island demographics revealed that in 2001, Islay had a population of 3457 residents, 22.2% of which were under 18 years of age (Scottish Census Results OnLine, 2012). In refining the scope of our exploration and seeking a

contemporary perspective on the island, we decided to engage with Islay's younger generation.

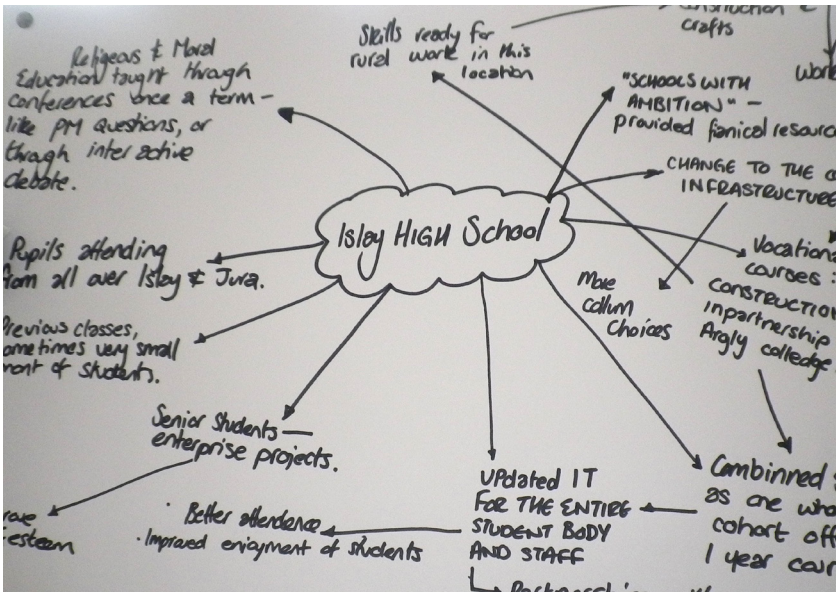

Fig. 5: Marianne McAra, *Identifying user groups* [photograph], source: Bell et al. (2011), *Islay Investigation*, Unpublished Masters in Design Innovation research report

To interrogate how children and teenagers perceive, use and experience Islay, we aimed to investigate the school pupils' cultural knowledge, social situations, future aspirations and emotional connections to their island. In this way, we sought their expert experiential accounts to supplement our developing knowledge of Islay.

Co-designing cultural probe packs

Working under the name *Pilotlight*, we branded our design collective and began to prototype tools to assist our enquiry into island culture. Whilst a traditional questionnaire poses a series of thematic questions in an attempt to directly garner user experience, the cultural probe helps facilitate a hands-on social activity to harness user creativity and advance the design process beyond its exploratory beginnings. These qualities attracted us to the cultural probe but this decision was also influenced by our project's emphasis on teamwork and collaboration. We were instinctively drawn towards the probes' capacity to be at once cohesive and eclectic and appreciated their democratic inclusion of each designer's specific skills and research interests. The probe materials' tangible and tactile qualities offer a visually seductive method to designers and indeed, we anticipated the collection of rich, visual stories to inspire our eventual design solutions (Mattelmäki and Battarbee 2002: 267). As Mattelmäki and Battarbee continue, the

designer-centric aspects of probe creation are pivotal in shaping context-specific participatory and ideation phases:

> The probes material and the assignments are designed for the purpose. The empathy building process begins with designing the material, imagining the possible contexts of experiences, projecting designers' own ideas and questions about the research and design issues, and preparing a sensitive ear for understanding another person.
>
> Mattelmäki and Battarbee, 2002: 268

Recognising the geographic, sociocultural and professional distinctions between ourselves as six postgraduate designers living in Glasgow aged 20 to 35 years old from the 32 high school pupils from Islay aged 11 and 12 years old, we created two sets of cultural probe pack. The pupils would complete the first version in our facilitated communal session (the workshop pack) while a second would be posted and distributed to each pupil two weeks before (the pre-pack). Our lack of direct familiarity with the island and its people propelled the cultural probe towards a template format intended to structure the pupils' responses rather than to dictate their content.

Fig. 6: Cara Broadley, *Pre-packs* [photograph], source: Author (2011)

Shown in Fig. 6, the pre-packs aimed to initiate a dialogue remotely, prior to our visit. Designer one (D1) developed her interests surrounding the retail industry, souvenirs and material culture by asking pupils to fill a labelled envelope with otherwise ephemeral items accumulated in a typical day:

> I included a small envelope that was to be filled with a chosen object they felt represented Islay and island life: anything from a piece of the landscape — a shell, a piece of heather. It might be a representation of their day-to-day lives, such as a photograph, drawing, receipt or even a bus ticket. The objects might signify what they love about Islay or what they hate. As long as it can fit into the envelope, the possibilities are endless.
>
> Bell et al., 2011: 28

Derived from our desk research findings surrounding the island's identity and its cultural traditions of storytelling, designer two (D2) used his collection of vector illustrations depicting thematic layers of island information to create a *Story Map*. Presented as a small book, the map's combination of illustrations and guiding questions encourages pupils to collaborate with a family member and use drawing and writing to share with us a story about their lives.

As the culmination of my own desk research, the postcard *Rural Legends* uses a cartoon drawing style to translate a personal connection to Islay (Fig. 7). During the introductory phase of the project, I aimed to collect experiences of Islay from Scottish mainlanders. This objective led to a conversation with my mother regarding our family history and ancestral link to the island:

> When I was young, my gran told me about how her dad's...cousin, I think — Lachie McFadyen — was reputedly the strongest man in Islay because he could lift a donkey over a hedge, backwards! Well, years later, I think about 1975, dad and I visited the island for a holiday. I wanted to find out more about this relative and I got talking to the owner of the hotel in the pub one night. I started to tell him the story and said excitedly "He was something of a local legend! He was the strongest man on the island —". At that point he interrupted me to exclaim smugly "Oh, is this the story about the guy who could apparently lift a donkey over a hedge backwards?!". Everyone else in the pub fell about laughing while another customer explained that they regularly have to tell gullible tourists that the story is a myth! I felt so embarrassed and disappointed. I suppose I'll never find out the truth behind our supposed donkey-lifting relative!
>
> Grace Broadley, 2011

Listening to my mother recall this anecdote reinforced the value in gathering subjective experiential accounts to gain an insight into island life. The story helped reduce the literal and metaphorical gaps separating myself from Islay, while my instincts as a designer and illustrator inspired me to translate this verbal narrative into a visual account. By retelling the tale to the pupils in a storyboard/postcard format, we aimed to introduce them to ideas of visualisation

and establish an empathic connection in preparation for our participatory insight gathering workshop.

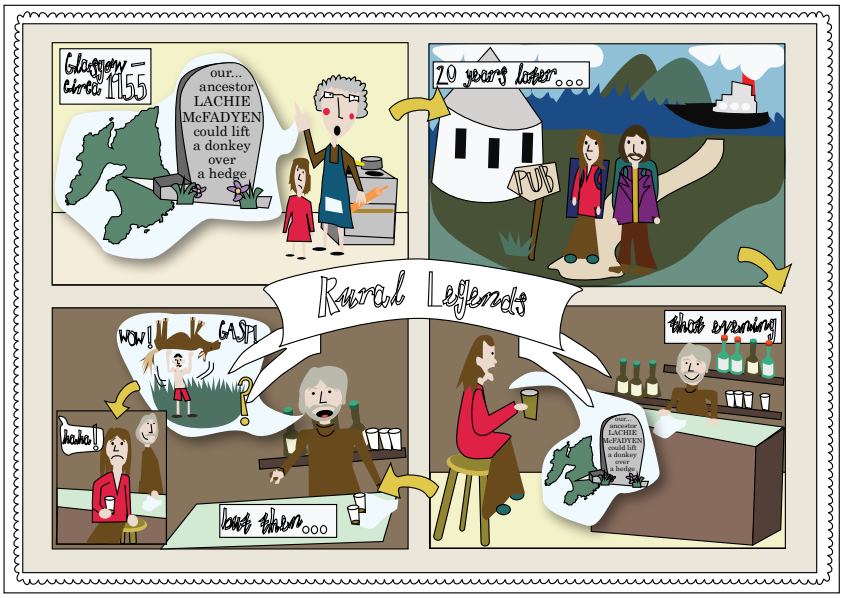

Fig 7: Cara Broadley, *Rural Legends postcard front* [drawing], source: Author (2011)

We assembled these three tools into bundles, tied them together with twine and attached a luggage tag printed with a brief introduction and instructions. The pre-packs' mixture of our subtly different graphic styles was acknowledged and celebrated as a means of strengthening the pupils reception of and engagement with a visually diverse workshop pack.

With the Pilotlight logo, the image of the island map, consistent language and print production, the workshop pack shown in Fig. 8 emulates the visual tone and material properties of its predecessor. Its folded burgundy and gold cover echoes the iconography of the British passport, signifying its journey from Glasgow to Islay and anticipating the cultural information it will discover and collect. Inside, my profile card uses a series of closed questions to ask for pupils' names, details of where they live and who with, and for a drawing of themselves to be sketched in the space provided. Such basic data is useful for analytical and comparative purposes, allowing our team to keep track of each pupil's individual responses as well as revealing details of their daily commutes, the size and diversity of their family units and general insights into personal identity. In an attempt to construct a picture of existing community champions, designer three's (D3) pack of six *Islay Playing Cards* asks pupils to indicate their local heroes and idols. This device was also adapted to ask pupils to consider the next 15 years and draw their future aspirations.

Fig. 8: Cara Broadley, *Workshop Pack* [photograph], source: Author (2011)

Developing the theme of career expectations and goals, the *Magic Camera* made by designer four (D4) invites pupils to look into its viewfinder and visualise their ideal occupation. In this way, we aimed to draw parallels between career opportunities and local industries and to infer why some young people pursue employment on the island while others choose to relocate to the mainland. The island's familiar outline is a dominant visual motif throughout both packs and was juxtaposed with text by designer five (D5) in a poster examining the pupils' tacit knowledge of tourist landmarks. Accompanying stickers condense aspects of our desk research into small photographs which pupils are instructed to attach to relevant locations on the map. Attempting to directly locate problems, D3 produced a simplified drawing of a litter bin encouraging pupils to metaphorically dispose of their dislikes. Meanwhile, my pair of empty speech bubbles invites pupils to translate a common island phrase into Gaelic. This offered us a means to evaluate the extent of the pupils' bilingual fluency and to partly address the fluctuating declines and revivals of the Gaelic language. Mirroring the layout and concept

of Rural Legends, the workshop pack also contains a second postcard with four empty frames. This provides pupils with an opportunity to visualise and share aspects of local knowledge that are otherwise inaccessible to visitors. Although not manufactured by the team, D1 included a small pile of sticky notes in each pack. These would be used in a rapid brainstorming session to explore how often the pupils visit the mainland and any significant facilities and services that are unavailable on the island.

The packs link our exploratory desk research to the more focused phase of user engagement and insight gathering. Concepts of travel are prevalent throughout. The material presence and conceptual connotations of luggage tags, passports, envelopes, cameras, maps and postcards emphasise our desire to uncover cultural information as both designers and visitors. Through our collaborative production of the pre-pack and workshop pack, we prepared to visit Islay to deliver our workshop via these souvenir-like artefacts.

Workshop design and pupil interactions

We were allocated two hours to work with the pupils. In order to manage our workshop within this time frame, we conferred as a group and allotted approximately five to fifteen minutes to deliver the cultural probe tools depending on the depth of information they each sought. Additional facilitation assistance was provided by four teachers. Like the pupils, this was their first encounter with the workshop packs. Despite their limited background knowledge of our project and the specific aims and activities of the workshop, the teachers grasped the premise of each tool with ease and clarity. Their presence was also beneficial as it validated our project's significance to the pupils and encouraged them to participate, as well as helping to supervise their behaviour. Our familiarity with the tools through regular prototyping, conversation and critique enhanced the pupils' interactions with the pack. Its design aided the workshop structure. Each designer briefly introduced their probe component and associated task before leading conversations with smaller pupil groups as they responded through text and imagery.

Perhaps resulting from the pre-packs they had already received, the majority of the pupils

engaged fully in each probe-based activity. We were concerned that the pupils' proficiency with interactive whiteboards and tablet computers could impact negatively on their engagement with our comparatively low-tech packs. Indeed, we noted that some of the pupils' handwriting and basic visual communication abilities were of poor quality and further research merits an exploration of the relationship between penmanship and an increased reliance on digital technology in educational environments. In spite of this, the pupils thrived on the passport concept and were determined to explore the packs' contents. They played games with the cards and took imaginary photographs with the magic camera, as Fig. 9 illustrates. Some asked if they could keep their pack, underlining its playful appeal. In this classroom setting, it is possible that some pupils were influenced by their peers' responses. We maintain, however, that the social bonds instigated by the workshop's communal and participatory nature outweigh the perceived scientific objectivity of a more traditional, solitary approach. Our facilitation also served to subtly prompt the less confident pupils to participate verbally, develop their conceptual thinking, emphasise the value of their subjective experiences, and encourage them to translate these thoughts onto paper.

Fig. 9: Yi Cai, *Workshop pack in action* [photograph], source: Bell et al. (2011), *Islay Investigation*, Unpublished Masters in Design Innovation research report

Graham and Rouncefield assess various forms of probes' participatory applications and advantages in the human-centred design process. Cultural probes can establish engagement between designers and users ('discursive participation'), support users in examining their daily experiences ('investigative participation') and subsequently encourage them to consolidate and

communicate their insights and emotions by directly annotating material artefacts (‘reflective participation’). In our open and exploratory process, we placed considerable emphasis on the empathic and imaginative elements of participation (Graham and Rouncefield, 2008: 196). On one level, our selection of the high school pupils as a primary user group informed the probe packs’ lighthearted visual style. However, in our short time spent with the pupils, we experienced significant instances of humour, camaraderie and relaxed, open discussion. Such observations suggest that the probes’ consistent, playful aesthetic sustained the pupils’ interest and rendered the insight gathering stage an opportunity for expression, empowerment and fun.

Evaluating responses collectively; proposing interventions individually

Following the workshop, we grouped, photographed, displayed and re-grouped the pupils’ completed probe packs for the purposes of content analysis. This stage marked a change in the group dynamic. Throughout the phases of desk research, cultural probe creation, workshop planning and facilitation, the team operated with a shared strategy and set of objectives. At the same time, each designer’s personal research interests remained apparent and contributed to the visual style and underlying conceptual concerns of their tools within the probe packs. Progressing from this stage of intra-team exploration and participatory insight gathering with the pupils, we became immersed in our own evaluation processes to locate patterns within the collected data and identify unmet needs. We then drew from our previous experiences of employing design research methods and utilised user profiles, storyboards, user journeys and prototyping techniques to devise an individual proposal for a design-led intervention on Islay. In this paper, time does not permit a detailed account of these convergent phases in the design process. As an alternative, I provide a brief summary of the proposals produced by three members of the team as well as discussing my own findings.

D1 returned to her original ideas surrounding the impact of materiality on island identity. Upon assessing the data gathered during our brainstorming exercise, she observed that the pupils appear preoccupied by the lack of fashion outlets, fast food restaurants and entertainment venues. However, her close interpretation of the probe responses suggested that the pupils are

not necessarily fixated on purchasing commodities, but are disengaged by the narrow choice of social activities on the island. To support this, she examined the maps and personal drawings returned in the envelope and the pupils' relaying of personal stories through the postcards and verbally throughout the workshop. *Islay Island Identity* employs a combination of user profiles, prototypes and user journeys to position the envelope task as the central element in a curatorial initiative. Each year, pupils are invited to source items that symbolise their daily experiences on the island. These objects are then displayed in the local museum, photographed, re-presented and sold as souvenir postcards as a sustainable means of creating a living archive of Islay life. This alternative perspective celebrates and promotes the next generation of islanders to locals and visitors whilst the object collection, sale of photographs and accompanying exhibition aim to instil a sense of local pride, ownership and enterprise in the pupils.

Interrogating Islay's cultural connections with storytelling further, D2 located discrepancies between the pupils' linguistic abilities and their identification with the Gaelic language. Following the workshop D2 reflected on the pupils' limited engagement with his story map. As an alternative method of data collection, he drew from his background in filmmaking to document an interview with a senior community member. This began as an open-ended discussion but later evolved into a critique of Gaelic teaching in Islay's schools. D1's source explained that despite being taught the language from an early age, there is a general consensus throughout the older generations that pupils perform Gaelic in a mimetic manner and thus, it is generally not implemented beyond the classroom setting (Bell et al., 2011: 42).

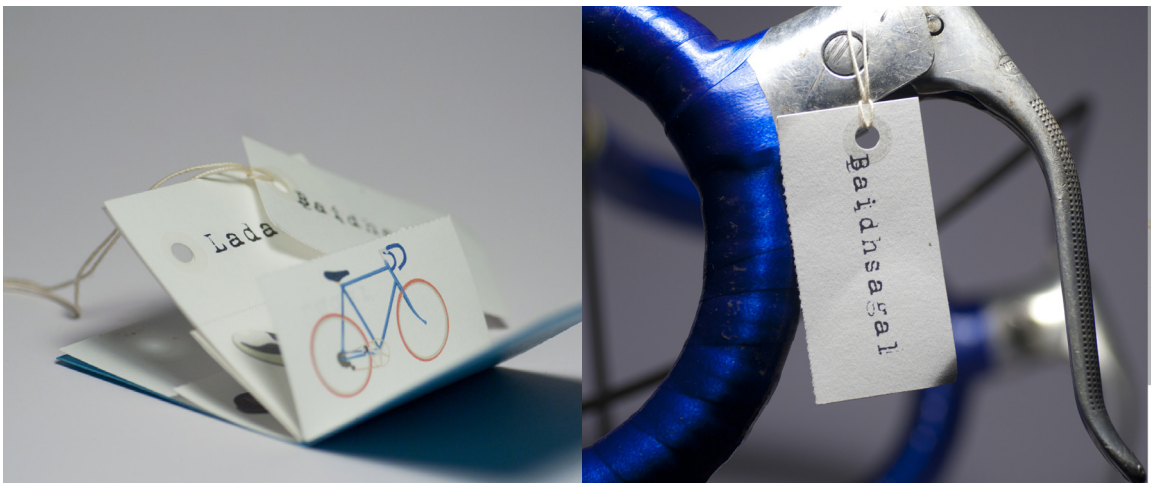

Fig. 10: Fergus Fullarton Pegg, *Gaelic Learning Method prototype* [photograph], source: Bell et al. (2011), *Islay Investigation*, Unpublished Masters in Design Innovation research report

Through his evaluation of the probe responses, designer two identified the relative lack of pupils able to successfully translate an English phrase into Gaelic. This corroboration of data directed his design thinking towards recontextualising the language as a salient yet implicit aspect of the islanders' daily routines. Following this line of inquiry, D2's intervention provides Gaelic learners with a small booklet of illustrations and textual labels. These users remove the labels and attach them to the corresponding physical objects in their homes, which then functions as an aid to memory. In Fig. 10 we can see D2's prototype booklet — its visual tone, font and inclusion of detachable labels all reminiscent of our original cultural probes.

Recalling her original interests surrounding employment opportunities and the future aspirations of young people living on the island, D3 concentrated on the diverse career goals described by the pupils through her playing cards and D4's magic camera. Searching for patterns, she arranged their career choices into themes and subsequently identified commonalities between their future ambitions:

> Having worked regularly with children of a similar age from Glasgow, it appeared to me that the careers chosen by the Islay participants were very grounded and on the whole very practical. It also became clear that our assumptions that the majority would like to leave the island were totally unfounded.
>
> Bell et al., 2011: 34

Fig. 11: Catherine Bell, *Islay Career Card prototype* [photograph], source: Bell et al. (2011), *Islay Investigation*, Unpublished Masters in Design Innovation research report

As D3's comments allude to, many of the pupils surprised us by expressing their desire to become involved in the island's agricultural industry, for example, and very few showed an interest in relocating to the mainland to train in colleges or universities. These insights informed D3's proposal for a multi-purpose participatory game and educational device. *Islay Career Cards* (Fig. 11) employ imagery and text to quantitatively grade a wide selection of careers in terms of whether they require university training, computer skills, creative abilities, enterprise, teamwork and travel. Through engaging with the cards pupils broaden their knowledge of potential career options, allowing them to make informed decisions on subject choices as they progress through high school.

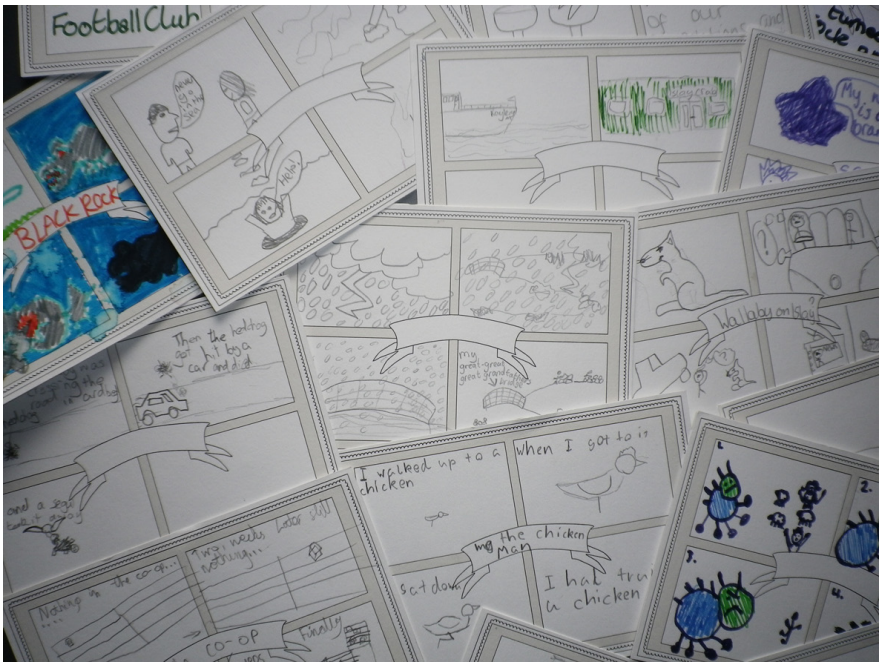

Fig. 12: Cara Broadley, *Edited selection of postcard responses* [photograph], source: Author (2011)

At the same time, I evaluated the pupils' interactions with the cultural probes and categorised the stories they written and drawn for us. The edited selection of postcards shown in Fig. 12 underline the pupils' loose and imaginative interpretations of storytelling. In this, some of their responses visualise myths and legends: the local tales and ghost stories that occupy the pupils' tacit knowledge such as the monster who ate a sheep and subsequently transformed into the area of the island known as Black Rock. Other pupils shared elements of their own lives as islanders, memorable encounters or personal achievements and skills, like the boy who promotes himself as being capable of training chickens. In a third category, some pupils focused on the experiences of their family members, either historically or more recently. For

instance, one girl told us about her father being interviewed on the regional news when he found an inexplicable dead wallaby on one of the islands country roads.

Fig. 13: Cara Broadley, *Family as Community storyboard 1* [drawing – detail], source: Author (2011)

Using these insights as inspirational material, I revisited each pupil's completed cultural probe packs and noted the prevalence of family identity across their individual tools. My resulting proposal — *Family as Community* — reinterprets the pupils' roles in the participatory design process to collate and share further data from their immediate family circles. In the first phase, a team of pupils are invited to become research assistants or Pilotlight Apprentices. Their experience of our workshop provides a frame of reference and rationale for a one-day training session on implementing simple data gathering tools and procedures. Fig. 13 shows a section from one of my two illustrative storyboards. Here, pupils have the opportunity to adapt and design new cultural probes tailored to their family members' daily routines and personalities. This activity aims to enhance the pupils' creative, communication, organisation and facilitation skills.

The second phase communicates Islay family histories and identities throughout local, regional, national and international communities and networks. To kick-start this further cycle of participation, I use the workshop data to compile a community-led guidebook. Profiling each pupil's family, this artefact celebrates the latent elements of everyday island life such as

the objects in their homes, their likes and dislikes, hobbies and interests, ancestry, holidays, traditions, favourite Islay landmarks, family mottos, nicknames and running jokes, all expressed in an accessible printed format. To accompany the book, senior pupils with web design experience are recruited as Pilotlight Developers — a team with a keen visual and technical sensibility and the resources required to produce a digital, interactive version that can easily be altered and added to as more family information is uncovered. The pupils' contributions as co-researchers, co-designers, co-facilitators and co-authors are key to the aims of my proposal. They are supported as project ambassadors in organising a promotional presentation and exhibition to stimulate feedback and involvement from the wider Islay community. Family as Community celebrates the individual and communal identities that comprise Islay through the collection, display and exchange of local knowledge.

On reflection, my proposal for a domestic, geographic and cultural exchange initiative recalls elements of my mother's story. The pupils' participation in the storytelling task exemplifies the designerly application of socially and visually mediated subjective knowledge. By explaining my probe activity in this graphically simplistic and accessible way, Rural Legends sparked the pupils' imagination, helped build rapport and instigated a narrative-based dialogue involving both the designers' and users' drawings. Furthermore, the rationale behind my proposal originates partly from the productivity of our teams' cultural probe creation phase. From evaluating the interventions proposed by D1, D2 and D3, the impact of our initial co-design is equally evident. D3's prototypes echo the visual style of our cultural probe packs and develop the card game as an engaging format for insight gathering tools. Whilst D1's proposal does not uncover a problem which can be improved through external factors, it recognises an opportunity to reconnect the young islanders to local resources through co-creative activities. In this, her intervention has a direct link to the collaborative and visual objectives underpinning our tools for data collection. While the pupils failed to completely engage with his Story Map, D2's original conceptual intentions prevailed throughout the entire design process and his appropriation of the Gaelic speech bubble cements our mutual ownership over the pre-pack and workshop pack components. At this stage, our proposals exist as conceptual ideas. However, upon evaluating their connections regarding Islay's cultural identity and the aspirational potential of its younger generation, it is possible that our design team will regroup in the future to undertake further data

collection and implement a collective intervention. These outcomes suggest that designerly communication and collaboration are driven and enriched by the agency given to the images and artefacts created in the course of design exploration.

Discussion: Using cultural probes as mediatory artefacts in exploratory co-design

The handmade, simplistic qualities of our probes helped establish empathy between our team and the pupils. As Mattelmaki and Battarbee's accounts imply, this blending of idiosyncratic words and images renders designers' and users' subjective insights as resources to be drawn from throughout the human-centred design process (2002: 270). Connor Graham, Mark Rouncefield, Martin Gibbs, Frank Vetere and Keith Cheverst maintain that feelings of ambiguity and uncertainty are inherent in probes-based studies and that through the consensual 'working out' process, diverse and surprising solutions can be generated from probe responses (2007: 34). In this sense, our research process followed the premise that the end results, our outcomes and outputs, respond to the serendipitous data we uncovered while moving between different geographic, sociocultural and professional territories. The insight gathering session was investigative and experimental rather than a linear means of connecting our desk research findings to potential interventions. This perspective is informed by and supports the notion that cultural probes do not claim to uncover a chain of factual data surrounding the experiences and needs of the people situated within the design setting. To agree with Gaver et al., the probes' exploratory nature promotes a combination of both open-ended and prescriptive questions to help designers extrapolate 'fragmentary clues' to frame and shape their resulting proposals (2004: 53). Indeed, the designers suggest that problems of authenticity may be encountered when designing solutions based on such emotive data alone, while Hanington and Martin agree that the interpretative character of cultural probes justifies an informal and innovative analytical strategy (2004: 55, 56; 2012: 54).

Our proposals were influenced and inspired by the pupils' participation in the workshop, their interactions with the pack materials and the content and quality of their responses. Cementing the use of probes to stimulate the development of design solutions, it therefore follows that

'designers need both information and inspiration to be innovative, in that sense all the user data should not be cut up into small dry facts' (Mattelmaki and Battarbee, 2002: 270). As evidenced in our proposals, the pupils' responses were pieced together and supplemented by our own subjective experiences of the entire Islay investigation. While remaining user-centred, this suggests that the designers' participation with users is underpinned by their own personal and professional identities and concepts of self-reflexivity. This methodological shift recalls Graham et al.'s criticisms of probes as reinterpretations of social scientific 'photography, life documents, biographical interviews, and structured diarizing' (2007: 35). However, as the ongoing development and uses of cultural probes indicates, methodological innovation follows on naturally from methodological inspiration. The cultural probes' eclectic qualities and multiple contextual applications confirm the value in human-centred design's propensity to blend methods that are at once conventional and innovative; rigid and imaginative; verbal and visual in order to enrich insight gathering and participation with users.

In terms of understanding the translation of co-design concepts into practice, our cultural probe creation process was significantly insightful and revealing. Supporting Mattelmäki's discussion of cultural probes as instigators of dialogue, the creativity surrounding their making promotes a form of discursive and critical collaboration amongst designers (2006: 207). Here, the visual outputs generated by our desk research highlight the presence and pertinence of epistemic objects in transferring and transforming subjective knowledge for the benefit of the co-design team. Ewenstein and Whyte identify the epistemic object's ability to make tangible 'a knowledge development process that proceeds in an ongoing and dialogical way; embodying a lack, raising a question, begging an answer, unfolding, developing a lack elsewhere, raising new questions, and so on' (2009: 27). The island map's incomplete and ambiguous amalgamation of marker pen lines, sticky notes, pinned on sketches, photographs and whisky miniatures evoked our individual curiosities and assumptions of Islay and provided an accessible thematic device for consideration by the group. By using this display to ask questions of ourselves and each other, we layered, annotated and recontextualised the map as a transitory and mutable repository of the team's collective knowledge.

The cultural probe packs underwent a corresponding conceptual and material transformation

through their creation. Each component was consciously presented by its respective designer-maker to the team as an unrefined artefact in order to elicit feedback. As a form of context-specific visual hypothesis, the probes waited patiently to be adjusted and amended. We thus delegated the responsibility of iteratively refining the probes throughout the team. We sent digital versions of our own tools to each other via email, we shared D2's vector illustration of the island map and applied it consistently across the tools, we printed and evaluated each other's prototypes and together, undertook the time-consuming process of trimming, folding and assembling the packs. These collaborative activities resulted in a collection of distilled epistemic probes that substantiate our developing knowledge of Islay and our project objectives at the pivotal point in the design process preceding the insight gathering workshop. Through this participatory phase with the pupils, the inquisitive epistemic probes gathered rich, interpretative evidence to underpin each designer's proposed intervention. Our visual proposals encompass the relevant probe responses as well as our user profiles, storyboards, user journeys and prototype designs. They visually symbolise the synthesis, interpretation and reconsideration of our insights as designers in parallel with the first-hand experiences of the pupils. In this sense, the continuous inclusion of the teams' images and artefacts helped structure and advance the design process.

Resulting from our team's mutual understanding of the cultural probe packs as a whole, each designer had the experiential knowledge and expertise to introduce each tool and activity to the pupils and effectively facilitate the workshop. It is of note that the project took place only a month into the academic year and featured a design team with limited previous experience of working together. As Hemmings et al. point out, the process of probe creation actively embraces the multiple skills and subjectivities of individual designers to build and sustain social cohesion in participatory design activities:

> This notion of collaboration extends to the work we observed in the CRD studio — it could be characterized as an intra-collaborative achievement. Design work here is plainly a social activity that involves and is organised around the sharing and exchange of ideas. We observed that, in and through their talk, members of the group exchanged personal information and continually repaired their understanding about each other. These ongoing biographical exchanges provide each member with context for their own, the group and participants behaviour. Seen this way, contextual knowledge provides a way sensitising and accommodating each other's actions and ideas in an appropriate manner.
>
> Hemmings et al., 2002: 50

In this context, our self-initiated process of visualising ideas, constructing prototypes and organising reflective feedback sessions served as an academic icebreaker. Sanders and Stappers voice their concerns over how the hierarchical distinctions between traditional design and co-design processes are defined and delivered through design education (2008: 16). This paper demonstrates that while the creative exploration advocated by co-design can be quickly grasped through practice, its ability to structure participation is heightened when mediatory images and artefacts are introduced as members of the design team. Our probes thus symbolise the research imagination of each designer. Their creation supports the degree of rapport, communication and collaboration needed for an effective designerly relationship. Constructed from printed, trimmed and folded cardboard, the probes embody our intricate structuring as designers in one unified form. Their back-to-basics appeal materialises our objective to carry out a concise, playful and engaging insight gathering session while offering the pupils respite from modern digital technology. The epistemic cultural probes are the site of experiential exchange and knowledge sharing, and confirm that co-design, as expressed in this tangible format, must begin within the design team itself.

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